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FROM OCTOBER 1929 TO JULY 1930

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# PROCEEDINGS AT THE MEETINGS OF THE PHYSICAL SOCIETY

SESSION 1929-1930

*Except where the contrary is stated the meetings were held at the Imperial College  
of Science and Technology, South Kensington.*

*October 25, 1929.*

W. H. ECCLES, D.Sc., F.R.S., and subsequently  
Prof. F. L. HOPWOOD, D.Sc., in the Chair.

1. The following was elected a Fellow of the Physical Society: Thomas Herbert Harrison.

The President announced that the following had been elected Student Members of the Physical Society: Wallace Scott, Leonard Ernest Sharp, Stanley John Welton, Ronald James Cox, Brian Clifford Fleming-Williams, Ernest Riddick.

2. The President laid on the table for inspection by Fellows a biographical notice of the late Mr T. H. Blakesley, which its author, Mr W. A. Price, had kindly presented to the Library.

3. The President welcomed Prof. Sir C. V. Raman, F.R.S., who was present on a visit from India.

4. A paper entitled "Some additional lines in the secondary spectrum of hydrogen," by F. C. CONNELLY, A.R.C.S., B.Sc., D.I.C., was taken as read in the absence of the author.

5. A paper entitled "The transverse velocity gradient near the mouths of pipes in which an alternating or continuous flow of air is established," by E. G. RICHARDSON, B.A., Ph.D., D.Sc., and E. TYLER, M.Sc., F.Inst.P., was read by Dr RICHARDSON.

6. A paper entitled "Resolving-power tests on microscope objectives used with ultra-violet radiation" was read by B. K. JOHNSON, F.R.M.S.

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*November 8, 1929.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: Donald William Read, Eric Oswald Hercus, Arthur Douglas Constable, Geoffrey Holte Aston, Frederick Daniel Smith, James Thewlis, G. Fergus Wood, Salih Mourat.

The President announced that the Council had elected the following a Student Member of the Society: Donald Walter Carter.

2. A lecture entitled "Diamagnetism and molecular structure" was given by Prof. Sir C. V. RAMAN, F.R.S.

A vote of thanks to the lecturer was proposed by Prof. E. N. DA C. ANDRADE, seconded by Mr T. SMITH, and carried by acclamation.

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*November 22, 1929.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. On the motion of the President, the meeting passed a resolution congratulating Prof. O. W. RICHARDSON, F.R.S., Past President of the Society, on the award to him of the Nobel Prize for Physics.

2. A paper entitled "Heaviside's operational method" was read by D. P. DALZELL.

3. A paper entitled "The dynamical theory of resonators" was read by E. T. HANSON, B.A.

4. A paper entitled "Escapement errors of pendulum clocks" was read by E. C. ATKINSON, M.A.

5. A demonstration of a model skidding vehicle was given by J. BRADLEY, B.A.

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*December 13, 1929.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: F. D. Murad, Donald Arthur Oliver, George Alexander Cruickshank, Dattatraya Gopal Matange.

2. A paper entitled "Apparatus for determining the specific heat of a material in powder form," by J. H. AWBERY, B.A., B.Sc., and EZER GRIFFITHS, D.Sc., F.R.S., Physics Department, The National Physical Laboratory, Teddington, Middlesex, was read by Mr AWBERY.

3. A paper entitled "The determination of the parameters in an empirical formula," by W. EDWARDS DEMING, Ph.D., Associate Physicist, Bureau of Chemistry and Soils, Washington, D.C., was read by Mr J. H. AWBERY, in the absence of the author.

4. A paper entitled "The J-phenomenon in X-rays," by N. S. ALEXANDER, M.Sc., National Research Scholar, Auckland University College, New Zealand, was taken as read, in the absence of the author.

5. A demonstration of a new periodic effect in a neon discharge tube was given by Miss W. A. LEYSHON, Ph.D.



6. A demonstration of a method of showing the phase relation between the flash and the fork in a fork-controlled flashing neon-tube circuit was given by Miss W. A. LEYSHON, Ph.D., and Miss TERESA M. DILLON.

7. Some apparatus for use in a hospital radium service was exhibited by Prof. F. LL. HOPWOOD, D.Sc.

*January 3, 1930.*

Prof. J. C. PHILIP, F.R.S., President of the Science Masters' Association, in the Chair.

A discussion was held on examinations in practical physics. Members of the Science Masters' Association participated.

*January 7, 8 and 9, 1930.*

The twentieth annual exhibition of the Physical Society and the Optical Society was held in the Imperial College of Science.

Discourses were delivered as follows:

*January 7th:* Right Hon. Lord RAYLEIGH, M.A., Sc.D., F.R.S., "Iridescent colours in nature from the standpoint of physical optics."

*January 8th:* Mr S. G. BROWN, M.I.E.E., F.Inst.P., F.R.S., "Gyro-compasses for gun-fire control."

*January 9th:* Sir AMBROSE FLEMING, M.A., D.Sc., F.R.S., "Television, present and future."

*January 24, 1930.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The President stated that the Council had sent a message of deep sympathy to the relatives of the late Prof. H. L. Callendar in the name of the Society. The Society had been represented at Prof. Callendar's funeral by Prof. A. O. Rankine and Mr Robert Whipple.

2. The following were elected Fellows of the Physical Society: Frederick L. Uppelmann, E. Nightingale, G. R. Jain, James Stanley Rogers.

3. A paper entitled "A method of examining stereoscopic photographs," by J. M. NUTTALL and E. J. WILLIAMS, was read by Mr T. SMITH, in the absence of the authors.

4. A note on "The photography of Fabry and Perot interferometer fringes by the use of a simple optical system" was read by S. E. GREEN, B.Sc., Imperial College of Science.

5. A paper entitled "Characteristics of discharge tubes under 'flashing' conditions, as determined by the use of a cathode ray oscillograph" was read by Miss W. A. LEYSHON, Ph.D.

6. A demonstration of a pH apparatus was given by W. E. DORAN, M.A., The Cambridge Instrument Co., Ltd.

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*February 14, 1930.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: Oscar Ulrich Vonwiller, Frank Allen Mitchell, John William Cottingham, Herbert Leslie Adams, Rhys Gerran Lloyd.

2. The President announced that the Council had awarded the Duddell Medal for 1930 to Prof. A. A. MICHELSON.

3. A paper entitled "A determination of the coefficient of diffusion of water vapour" was read by W. E. SUMMERHAYS, B.Sc., The University of Birmingham.

4. A paper entitled "A method of calculating the numerical equation of state for helium below 6° abs., and of estimating the relative importance of gas degeneracy and interatomic forces" was read by M. C. JOHNSON, M.A., M.Sc., Physics Department, University of Birmingham.

5. A paper entitled "The magnetostriction constant for alternating magnetic fields" was read by F. D. SMITH, M.Sc., A.M.I.E.E.

6. A demonstration of a model illustrating the mosaic theory of the compound eye, due to Altenburg, lent by the Zoological Department, King's College, University of London, was given by Captain C. W. HUME, M.C., B.Sc.

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*February 28, 1930.*

W. H. ECCLES, D.Sc., F.R.S., and subsequently Prof. F. L. HOPWOOD, D.Sc., in the Chair.

1. The following were elected Fellows of the Physical Society: V. D. Dabholkar, William Band, David Kirk McCleery, Frank Lucas Warburton, Donald Percy Dalzell.

2. A paper entitled "A new type of Dewar flask, for use as a calorimeter" was read by W. L. WATTON, B.Sc., A.R.C.S., D.I.C., Imperial College of Science.

3. A paper entitled "Field intensity measurements around some Australian Broadcast stations," by R. O. CHERRY, M.Sc., Natural Philosophy Laboratory, University of Melbourne, was read by Mr R. A. WATSON WATT, in the absence of the author.

4. A paper entitled "The equations of motion of a viscous fluid in tensor notation" was read by C. N. H. LOCK, M.A.

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March 14, 1930.

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Society: Charles Albert Edward Wish, Samuel Morris Bower, O. A. Ankersmit, Robert W. King and Dorothy Agnes Goodman.

2. A paper entitled "A harmonic analyser" was read by J. HARVEY, A.R.C.S., B.Sc., City and Guilds Engineering College.

3. A paper entitled "A method of comparing small magnetic susceptibilities" was read by R. A. FEREDAY, B.Sc., East London College.

4. A paper entitled "The masses of the proton and electron" was read by H. T. FLINT, University of London, King's College.

5. Dr EZER GRIFFITHS, F.R.S., of the National Physical Laboratory, exhibited some lantern slides in connection with his recent visit to New Zealand.

*Annual General Meeting, March 28, 1930.*

W. H. ECCLES, D.Sc., F.R.S., in the Chair.

1. The minutes of the preceding Annual Meeting were read and confirmed.

2. The Duddell Medal, 1929, was presented *in absentia* to Prof. A. A. MICHELSON.

Mr David McK. Key, a Secretary of the United States Embassy, received the medal on behalf of Prof. Michelson and expressed his thanks for this honour.

3. The Reports of the Council and of the Hon. Treasurer were presented and adopted.

4. Dr H. BORNS and Mr J. NICOL having been appointed scrutineers, the following officers and members of Council were elected for the year 1930-31:

*President:* Prof. A. S. Eddington, M.A., D.Sc., F.R.S.

*Vice-Presidents (who have filled the office of President):* Sir Oliver J. Lodge, D.Sc., LL.D., F.R.S.; Sir Richard Glazebrook, K.C.B., Sc.D., F.R.S.; Sir Arthur Schuster, Ph.D., Sc.D., F.R.S.; Sir J. J. Thomson, O.M., D.Sc., F.R.S.; Prof. C. Vernon Boys, F.R.S.; Prof. C. H. Lees, D.Sc., F.R.S.; Prof. Sir W. H. Bragg, K.B.E., M.A., F.R.S.; Alexander Russell, M.A., D.Sc., F.R.S.; F. E. Smith, C.B., C.B.E., D.Sc., F.R.S.; Prof. O. W. Richardson, M.A., D.Sc., F.R.S.; W. H. Eccles, D.Sc., F.R.S.

*Vice-Presidents:* R. W. Paul, M.I.E.E.; Prof. A. O. Rankine, O.B.E., D.Sc.; J. S. G. Thomas, D.Sc.; J. Guild, A.R.C.S., D.I.C.



*Hon. Secretaries:* Ezer Griffiths, D.Sc., F.R.S.; Allan Ferguson, M.A., D.Sc.

*Hon. Foreign Secretary:* Prof. O. W. Richardson, M.A., D.Sc., F.R.S.

*Hon. Treasurer:* R. S. Whipple, M.I.E.E.

*Hon. Librarian:* J. H. Brinkworth, M.Sc., A.R.C.S.

*Ordinary Members of Council:* Miss A. C. Davies, D.Sc.; J. H. Awbery, B.Sc.; T. Smith, M.A.; W. Jevons, D.Sc., D.I.C.; Prof. W. Wilson, Ph.D., D.Sc., F.R.S.; D. Owen, B.A., D.Sc.; Sir Richard Paget, Bart.; Major I. O. Griffith, M.A.; D. W. Dye, D.Sc., F.R.S.; A. B. Wood, D.Sc.

5. Votes of thanks to the auditors (proposed by Dr J. S. G. THOMAS and seconded by Dr D. W. DYE), to the retiring officers and Council (proposed by Dr J. H. VINCENT and seconded by Major E. O. HENRICI), to the Governors of the Imperial College for permission to meet at the College (proposed by Mr T. SMITH and seconded by Prof. F. L. HOPWOOD), to Dr DYE for temporarily acting as Hon. Secretary for Business (proposed from the Chair), and to the scrutineers (proposed from the Chair), were carried unanimously.

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*Ordinary Meeting following the Annual General Meeting.*

Prof. Sir ARTHUR EDDINGTON, M.A., D.Sc., F.R.S., in the Chair.

1. The following was elected a Fellow of the Physical Society: Albert Ernest Roberts Westman.

2. The meeting adjourned to the Electrical Engineering Department of the City and Guilds (Engineering) College, where by arrangement with the Delegacy, the staff and students of the department showed some of the research work now in progress.

*April 11, 1930.*

Prof. Sir ARTHUR EDDINGTON, M.A., D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: William Herbert Aldous, Ronald Curry, Geoffrey Price Gowlland, Neville Melton Bligh.

2. The Fifteenth Guthrie Lecture was delivered by Prof. P. DEBYE of the University of Leipzig, who took as his subject "The scattering of X-rays in gases in relation to molecular structure."

3. A vote of thanks to the lecturer was moved by Prof. O. W. RICHARDSON and seconded by Prof. F. G. DONNAN.

---

May 9, 1930.

J. S. G. THOMAS, D.Sc., and subsequently Mr J. GUILD, in the Chair.

1. A paper entitled "Surface resistivity measurements on solid dielectrics" was read by L. HARTSHORN, D.Sc., A.R.C.S., D.I.C.

2. A paper entitled "The generation of sound by the siren principle," by E. SIMEON, was read by Dr J. S. G. THOMAS.

3. A demonstration of the regional absorption of dyes by growing crystals was given by Dr A. G. MILLIGAN, of the Admiralty Research Laboratory.

May 23, 1930.

Prof. Sir ARTHUR EDDINGTON, M.A., D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: Lyndon Bastings, Edward George Lewin, Charles Vivian Jackson, Carl Howard Collie, Patrick Johnson, Wilfred Earnshaw Benham, Derek Jackson.

*A discussion on magnetism was held.*

The discussion was opened by Sir ALFRED EWING, F.R.S., with a paper on "Ferromagnetism and hysteresis."

The following also contributed papers:

Dr E. C. STONER, "Magnetism in the twentieth century." Prof. H. S. ALLEN, "Magnetism and the quantum theory." Prof. C. G. DARWIN, F.R.S., "The polarization of the electron." Mr W. SUCKSMITH, "The gyromagnetic effect and paramagnetism." Mr F. C. POWELL, "On the change in size of a ferromagnetic at the Curie point" (communicated by Mr R. H. Fowler). Prof. W. PEDDIE, "The interrelations of magnetization and temperature in crystals." Prof. P. WEISS and Dr R. FORRER, "L'aimantation à saturation des ferro-cobalts et des nickel-cobalts et les moments atomiques des trois métaux." Prof. W. GERLACH, "Neue Zusammenhänge von magnetischen u. elektrischen Erscheinungen." Dr P. KAPITZA, "Methods of experimenting in strong magnetic fields." Dr W. L. WEBSTER, "Magnetostriktion and change of resistance in single crystals of iron and nickel." Dr L. F. BATES, "Observations on the specific heats of ferromagnetic substances." Dr J. R. ASHWORTH, "Relationships among the ferromagnetic constants."

June 13, 1930.

Prof. Sir ARTHUR EDDINGTON, M.A., D.Sc., F.R.S., in the Chair.

1. The following were elected Fellows of the Physical Society: Geoffrey Grime, Harry Buckley, H. E. Beckett, William Eric Newsome.

2. A paper entitled "The induction of electromotive forces in a moving liquid by a magnetic field, and its application to an investigation of the flow of liquids" was read by E. J. WILLIAMS.

3. A paper entitled "The motion of a liquid in an enclosed space" was read by E. J. WILLIAMS.

4. A paper entitled "Some notes on wireless methods of investigating the electrical structure of the upper atmosphere (II)," by Prof. E. V. APPLETON, F.R.S., was read by Mr G. A. RATCLIFFE.

5. A paper entitled "A simple method of showing the modes of vibration of a wire" was read, and a demonstration was given by C. R. DARLING, F.Inst.P., F.I.C., Assistant Professor of Science, Royal Military Academy, Woolwich.

6. A demonstration of "A modified Callendar recorder for the automatic control of a high-temperature oil bath" was given by Dr H. R. LANG, of the Imperial College of Science.

#### *Visit to Rugby, June 14, 1930.*

On arrival at Rugby the visitors made a tour of the works of the British Thomson Houston Company, Ltd. The party were the guests of the Company to lunch, which was served in the Staff Restaurant. In the afternoon the high power wireless station at Hillmorton was inspected, and later the party visited Rugby School where they were the guests of the Headmaster at tea. Mr MEIER, the Senior Science Master, organized the arrangements for a tour of the school.

The president, Sir ARTHUR EDDINGTON, M.A., D.Sc., F.R.S., expressed the thanks of the Society to the authorities of the British Thomson Houston Company and the Headmaster of Rugby School for their hospitality.

#### *June 26, 1930.*

Mr R. W. PAUL in the Chair.

1. A paper entitled "The effect of photosensitized mercury vapour on the walls of silica vacuum tubes" was read by M. C. JOHNSON, M.A., M.Sc.

2. A paper entitled "A sensitive rotating-coil magnetometer," by H. R. NETTLETON, D.Sc., and F. H. LLEWELLYN, B.Sc., Birkbeck College, was read by Mr NETTLETON.

3. A paper entitled "The frequency errors of rectifier instruments of the copper-oxide type for alternating current measurement" was read by L. HARTSHORN, D.Sc., A.R.C.S., D.I.C.



4. A paper entitled "A method of eliminating the effects of magnetic disturbance in highly sensitive galvanometers" was read by D. S. PERFECT, M.A., D.Phil., F.Inst.P., National Physical Laboratory.

5. The following papers were read in title:

"The thermal insulating properties of fabrics," by M. C. MARSH, M.A., B.Sc., A.Inst.P., British Research Association for the Woollen and Worsted Industries.

"Classical quantum theory and X-ray excitation by canal rays and alpha-particles," by WILLIAM BAND, M.Sc., Yenching University.

"Diffusion into an infinite plane sheet subject to a surface condition; with a method of application to experimental data," by A. T. MCKAY.

"Intensity modifications in the spectrum of mercury," by S. TOLANSKY, B.Sc., Research Fellow, Armstrong College.

"A vacuum tube commutator; the production of a periodic pulse of potential of square wave-form," by C. F. POWELL and K. H. MANNING.



## REPORT OF COUNCIL FOR THE PERIOD ENDING FEBRUARY 28TH, 1930

### MEETINGS

DURING the period covered by the Report 20 Ordinary Science Meetings were held at the Imperial College of Science and elsewhere. At these meetings 46 papers were presented and 13 demonstrations given. By the kind invitation of Prof. S. W. J. Smith about 60 members of the Society and their friends visited Birmingham on July 6. Five papers were read by workers in the Laboratory. The members of the Society inspected the Physics Block where a number of demonstrations were given and also some demonstrations in the Mechanical Engineering Department.

On November 8 a lecture was delivered by Sir C. V. Raman entitled "Diamagnetism and Molecular Structure."

On April 26 a discussion on the Teaching of Geometrical Optics was held, 95 Fellows and visitors being present.

### EXHIBITIONS

Since the period covered by the last Report two Exhibitions, arranged jointly by the Physical and Optical Societies, have been held, through the courtesy of the Governing Body, at the Imperial College of Science.

*Nineteenth Annual Exhibition.* This was held on January 8, 9 and 10, 1929, and trade exhibits were arranged by 83 firms. The Research and Experimental Section and the Historical Section contained exhibits from 30 sources. Discourses were given by Prof. F. Lloyd Hopwood on "Experiments with High Frequency Sound Waves"; by Mr Conrad Beck on "Lenses" and by Mr A. J. Bull on "Some Colour Problems in Photo-Engraving."

*Twentieth Annual Exhibition.* This was held on January 7, 8 and 9, 1930. Eighty-three firms exhibited, and the Research and Experimental Section and Historical Section contained exhibits contributed from 40 sources. Discourses were given by the Right Hon. Lord Rayleigh on "Iridescent Colours in Nature from the Standpoint of Physical Optics"; by Mr S. G. Brown on "Gyro-Compasses for Gun-Fire Control" and by Sir Ambrose Fleming on "Television, Present and Future."

With the object of encouraging Craftsmanship in the Scientific Instrument Trade a new section in the Exhibition was formed in which the work of apprentices and learners was exhibited in competition.

### OFFICERS

During the latter part of the year Dr D. W. Dye acted as Business Secretary whilst Dr Ezer Griffiths was absent in South Africa and New Zealand. Mr T. Martin resigned his position as Assistant Secretary and Dr J. J. Hedges was appointed as his successor.

### REPRESENTATIVES ON OTHER BODIES

Dr A. Ferguson and Dr Ezer Griffiths have been appointed as representatives of the Society on the Board of the Institute of Physics. Dr Ferguson was appointed the representative of the Society on the Colloid Committee of the Faraday Society and Mr T. Smith on a Joint Committee to consider the Teaching of Geometrical Optics. Dr D. Owen and Dr A. Ferguson represented the Society on the Science Abstracts Committee.



## AWARD OF THE DUDELL MEDAL

At the meeting on April 19 the Sixth (1928) Duddell Medal was presented to Dr C. E. Guillaume, an Honorary Fellow of the Society. The Council has awarded the Seventh (1929) Duddell Medal to Prof. A. A. Michelson.

## GUTHRIE LECTURE

Prof. P. W. Bridgman delivered the Fourteenth Guthrie Lecture on April 19, the subject being "The Properties of the Elements under High Pressure." About 150 Fellows and visitors were present.

## OBITUARY

The Council records with deep regret the deaths of: Prof. H. L. Callendar, a Past President of the Society; Mr J. Walker, who joined the Society 47 years ago and served as a Vice-President; Mr T. H. Blakesley, who joined the Society 45 years ago and served for some time as Secretary; Mr A. A. Campbell Swinton, one time member of Council; and also Sir H. T. Wood, Mr A. C. Cockburn, Mr J. M. Gorham, Mr E. F. J. Love, Mr F. J. Mudford, Mr R. H. Rinaldi, Mr T. A. Garrett, Mr W. R. Bower and Mr P. G. Gundry.

The practice of publishing Obituary Notices of eminent Fellows of the Society has been resumed.

## MEMBERSHIP ROLL

The number of Honorary Fellows on the Roll on December 31, 1929 was 11. At the same date Ordinary Fellows numbered 724 and Students 51.

The changes in the membership of the Society are shown in the appended table:

	Total Dec. 31, 1928	Changes during 1929	Total Dec. 31, 1929
<i>Honorary Fellows</i>	10	Elected ... .. 1 Net increase ... .. 1	11
<i>Ordinary Fellows</i>	690	Elected ... .. 45 Student transfers ... .. 5  Deceased ... .. 7 Resigned or lapsed ... .. 9 — 16 Net increase ... .. 34	724
<i>Students</i> ...	47	Elected ... .. 10 Trans. to Fellow ... .. 5 Resigned ... .. 1 — 6 Net increase ... .. 4	51
<i>Total Membership</i>	747	Net increase ... .. 39	786

## REPORT OF THE TREASURER

THE income for the year 1929 exceeded the expenditure by £182. 18s. 7d. Of this amount £100 is due to the revaluation of the stock of publications. The Society has received the refund of taxes on its investment income for the years 1926, 1927 and part of 1928. It is greatly indebted to the Council of the British Association for the help given in connection with this matter.

The Cambridge University Press being unable to undertake the work connected with the publication of the Proceedings and other publications of the Society, it was decided in 1928 that, with the help of the Institute of Physics, the Society would act as its own publisher. This arrangement has worked satisfactorily.

The Society desires to thank the Council of the Royal Society for a grant of £150 towards the cost of its publications. It is estimated that more than this sum will be absorbed in payment for a special report in course of preparation.

£600 of  $2\frac{1}{2}\%$  Consolidated Stock was purchased in October at a cost of £325. 3s. 6d.

The Society's investments have been valued at market prices through the courtesy of the Manager of the Charing Cross Branch of the Westminster Bank. Owing to the serious depression of the stock market their value was approximately 5 % less on December 31st, 1929 than at the corresponding period in the previous year.

(Signed) ROBERT S. WHIPPLE  
*Honorary Treasurer*

*March 7th, 1930*

# INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1929

1928			1928			1928			1928					
£	s.	d.	To	EXPENDITURE	£	s.	d.	By	INCOME	£	s.	d.		
500	0	0	0	Stock of Publications at 1st January, 1929	500	0	0	0	Stock of Publications at 31st December, 1929	500	0	0		
535	0	0	0	"Science Abstracts"	647	0	0	0	Subscriptions:					
				Ordinary Publications:					Fellows*	1128	11	10		
959	8	0	0	"Proceedings"					(Voluntary†)	8	8	0		
61	14	9	0	"Bulletin" and Notices	1126	1	11		Students	26	4	6		
93	17	2	0	General	65	13	1		For "Science Abstracts" and Advance					
					56	6	3		Proofs	74	17	0		
103	2	7	0	Postage on Publications	1248	1	3							
62	3	6	0	Reporting at Meetings	120	0	7							
32	3	1	0	Expenses at Meetings	72	17	1							
576	13	5	0	Exhibition Expenses	34	13	5							
45	12	6	0	Optical Society Exhibition Account	610	15	8							
					56	2	3							
13	10	10	0	Periodicals and Library	666	17	11							
104	14	8	0	Administration Expenses:	6	4	7							
100	18	0	0	Institute of Physics										
				Office Expenses	178	18	8							
					110	7	9							
20	0	0	0	Guthrie Lecture (Honorarium)	289	6	5							
47	3	9	0	Provincial Meeting (Birmingham):	20	0	0							
52	5	9	0	Railway and Luncheon Expenses	28	15	4							
96	6	1	0	Reprinting parts of "Proceedings"										
				Special Expenses on Transfer of Publishing										
98	3	7	0	Balance, being excess of Income over Expenditure, carried forward	182	18	7							
£3502 17 8					£3816 15 2					£3816 15 2				
To				Subscriptions written off					By	Balance brought forward				
				Balance carried to Accumulated Fund						Income Tax refunded for 1926, 1927 and 1928				
											</			



# BALANCE SHEET AT 31ST DECEMBER, 1929

## LIABILITIES

### Accumulated Fund:

As per last Balance Sheet . . . . .  
 Entrance Fees, 1929 . . . . .  
 Balance brought forward from Income and Expenditure account . . . . .

Less Decreased value of Investments . . . . .

### Life Compositions:

As per last Balance Sheet . . . . .  
 Received during year . . . . .

### Duddell Memorial Trust Fund:

As per last Balance Sheet . . . . .  
 Less Decreased value of Investments . . . . .

### W. F. Stanley Trust Fund (For the "Bulletin"):

As per last Balance Sheet . . . . .  
 Less Decreased value of Investments . . . . .

### A. W. Scott Bequest

Sundry Creditors . . . . .  
 Subscriptions paid in advance . . . . .

£ s. d. £ s. d.

2131 17 2  
 35 14 0  
 214 11 11  
 2382 3 1  
 220 3 6  
 2289 10 0  
 31 10 0  
 437 12 9  
 11 0 0  
 361 0 0  
 17 0 0  
 344 0 0  
 250 0 0  
 452 4 4  
 46 18 3

## ASSETS

### Investments at Market Value on date:

£399 London Midland and Scottish Railway 4 %  
 Debenture Stock . . . . .  
 £1900 London Midland and Scottish Railway 4 %  
 Preference Stock . . . . .  
 £211 London County Council 4½ % Stock  
 £400 Lancaster Corporation 3 % Redeemable Stock  
 £254, 2s. 9d. New South Wales 5 % Stock 1935/55  
 £500 London and North Eastern Railway 4 %  
 Debenture Stock . . . . .  
 £500 India 3½ % Stock . . . . .  
 £650 Funding Loan 4 % 1960/90  
 £650 War Loan 5 % 1929/47 Inscribed "A" Account  
 £150 Southern Railway 5 % Debenture Stock . . . . .  
 £600 Consolidated Stock 2½ % . . . . .  
 £400 War Loan 5 % 1929/47 Inscribed "B" Account  
 £300 Southern Railway Preferred Ordinary Stock  
 £442 Southern Railway Deferred Ordinary Stock . . . . .

### Stock of Publications (as per Treasurer's Valuation)

Subscriptions due . . . . .

Sundry Debtors . . . . .

Inland Revenue—Income Tax reclaimed for 1929 . . . . .

Cash at Bank:

On Deposit Account . . . . .

On Current Account . . . . .

Cash in hand . . . . .

4780 0 0  
 600 0 0  
 19 8 6  
 50 13 7  
 20 2 9

£6002 14 11

ROBERT S. WHIPPLE, *Honorary Treasurer.*

We have audited the above Balance Sheet and have obtained all the information and explanations we have required. We have verified the Bank Balances and the Investments. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Society's affairs according to the best of our information and the explanations given to us and as shown by the books of the Society.

SPENCER HOUSE, E.C. 2  
 18th March 1930.

KNOX, CROPPER & CO.,  
*Chartered Accountants*

Examined and approved on behalf of the Society

(Signed) E. H. RAYNER.  
 (Signed) J. H. AWBERRY.

# LIFE COMPOSITION FUND AT DECEMBER 31ST, 1929

128 Fellows paid £10	.	.	.	.	£	s.	d.
3 Fellows paid £15	.	.	.	.	1280	0	0
1 Fellow paid £20	.	.	.	.	45	0	0
1 Fellow paid £20, 10s.	.	.	.	.	20	0	0
14 Fellows paid £21	.	.	.	.	20	10	0
21 Fellows paid £31, 10s.	.	.	.	.	294	0	0
	.	.	.	.	661	10	0
168					£2321	0	0

## W. F. STANLEY TRUST FUND (FOR THE "BULLETIN")

£300 Southern Railway Preferred Ordinary Stock	£	s.	d.		£	s.	d.
£442 Southern Railway Deferred Ordinary Stock	216	0	0	Carried to Balance Sheet	344	0	0
	128	0	0				
	£344	0	0		£344	0	0

## DUDELL MEMORIAL TRUST FUND

CAPITAL			
	£	s.	d.
£400 War Loan 5 % 1929/47 Inscribed Stock	400	0	0
Carried to Balance Sheet			
	400	0	0
REVENUE			
	£	s.	d.
Balance at 31st December, 1928	26	12	9
Dividends	20	0	0
	46	12	9
Honorarium to Medallist			
Balance carried to Balance Sheet			
	26	12	9
	46	12	9